

A SUMMARY OF THE YUKON RIVER
FALL CHUM SALMON TAGGING STUDY,
1976-1978

By

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PREFACE

The results of the Yukon River fall chum salmon tagging study have been reported in several technical Federal Aid reports. Since some tag returns are received long after completion of the study, each report presents slightly different statistics. The late returns have not altered conclusions, but have led to inconsistencies in the reports. This brief summary report presents data that is properly documented and stored on computer file. The data presented in this report should be considered final, and supercedes any previous discrepancies.

INTRODUCTION

Chum salmon occur in two discrete runs in the Yukon River drainage. Fall chums can be distinguished from summer chums by their later run timing (mid-July to late August), larger body size (7-9 lbs.), and bright silvery appearance. Fall chums spawn in the upper portion of the drainage (Figure 1) in spring fed streams and sloughs. Major spawning areas include the Chandalar, Sheenjek and Fishing Branch rivers in the Porcupine drainage, and the Toklat, Delta and main Tanana River in the Tanana drainage.

Fall chum salmon abundance fluctuates greatly. In the five year period, 1974-1978, fall chum abundance ranged from a low of 331,000 to a high of 894,000 (Table 1). While maximum sustained yield is the goal of the management program, effective management requires an adequate escapement of each spawning stock. This objective is complicated by the fact that the commercial and subsistence harvest occurs hundreds of miles and several weeks from the spawning grounds. In many cases, the effect of a management strategy can be assessed only after the fishing season is over and the individual stocks have reached the spawning grounds. Identification of the stocks in the fishery would allow for management on a more stock specific basis.

A fall chum salmon tagging study was initiated in 1976 to determine whether upper Yukon and Tanana River stocks could be distinguished in the Galena-Ruby area of the Yukon River. The study was concluded in

1978. The purpose of this report is to briefly summarize the significant results of the study.

METHODS

Fall chum salmon were captured in fishwheels and tagged with individually numbered Petersen disk tags. The location of the fishwheels was as follows:

<u>Year</u>	<u>Yukon River Bank</u>	<u>Location</u>
1976	North	Galena
	South	Galena
1977	North	Galena
	South	Galena
	South	Ruby
1978	North	Tanana Village
	North	Yukon - 30 mi. above Tanana
	South	Yukon - 29 mi. above Tanana
	South	Ruby

A two dollar reward was offered to fishermen for each tag returned with information as to capture location, date and gear. In addition, Department personnel conducted spawning ground surveys to recover tagged fish.

RESULTS AND DISCUSSION

A total of 1,217 fall chums were tagged in 1976, 5,358 in 1977, and 9,668 in 1978 (Table 2). Tag recoveries totalled 608 (50%) in 1976,

1,951 (36%) in 1977, and 4,682 (48%) in 1978 (Table 2). For each year over 90% of the tag returns came from U.S. fishermen, with the balance from Canadian fishermen and spawning ground surveys.

Analysis of the tag recoveries indicates a significant difference in bank orientation between upper Yukon and Tanana River fall chum salmon stocks. Seventy-nine percent of the fish recovered in the upper Yukon River in 1976 had been tagged on the north bank, 21% on the south bank (Figure 2). Conversely, 87% of the fish recovered in the Tanana River had been tagged on the south bank of the Yukon River, 13% on the north bank. These results are reinforced by the 1977 study. Eighty-eight percent of the fall chums recovered in the upper Yukon River in 1977 had been tagged on the north bank, 12% on the south bank. Conversely, 96% of the fish recovered in the Tanana River had been tagged on the south bank of the Yukon River, only 4% on the north bank.

Since three of the four fishwheels operated in 1978 were located at or above the confluence of the Yukon and Tanana rivers, results from that study do not apply to this discussion. However, it is clear from the 1976 and 1977 tagging studies that upper Yukon River fall chum salmon migrate mostly along the north bank, and Tanana River fall chum salmon migrate mostly along the south bank of the Yukon River in the Galena-Ruby area. It is not known how much further downriver the stocks become separated by bank orientation, although it is safe to assume that the separation remains distinct from Galena to the confluence of the Yukon and Tanana Rivers.

Figure 1. Map of the fall chum salmon study area.

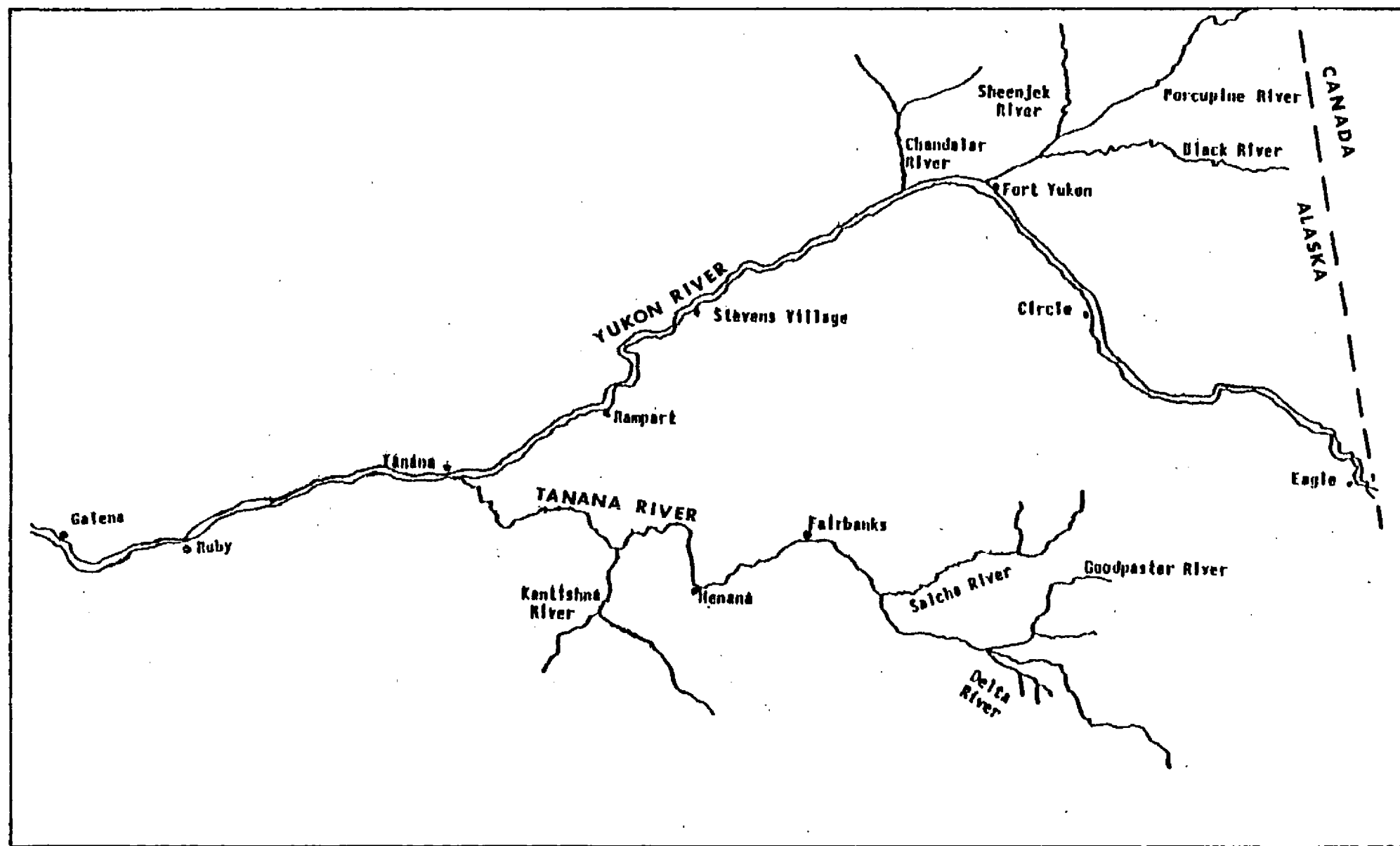


Table 1. Population size, harvest and escapement of Yukon River fall chum salmon, 1974-1978, in thousands of fish.

<u>Year</u>	<u>Population</u>	<u>Harvest</u>	<u>Exploitation Rate</u>	<u>Observed Escapement</u>
1974	513	369	0.72	144
1975	894	355	0.40	539
1976	331	236	0.71	78
1977	513	339	0.66	114
1978	460	339	0.74	88
5 Year Average	542	328	0.61	193

Note: Harvest includes all commercial and subsistence catches for the entire Yukon River drainage. Escapement estimates based on aerial survey counts by ADF&G biologists, and include weir counts on the Fishing Branch River, Canada, in 1974 and 1975. Population abundance is the sum of harvest and observed escapement for 1974 and 1975, while the sum of lower Yukon River harvest and upper Yukon River tag/recapture population estimates in 1976-1978.

Table 2. Yukon River fall chum salmon tagged and recovered, 1976-1978.

<u>Year</u>	<u>Fish Tagged</u>	<u>Tag Recoveries - US</u>			<u>Tag Recoveries-Canada</u>			<u>Total Tag Recoveries</u>
		<u>Fishery</u>	<u>Survey</u>	<u>Total</u>	<u>Fishery</u>	<u>Survey</u>	<u>Total</u>	
1976.	1,217	576	29	605	1	2	3	608 (50%)
1977	5,358	1,834	107	1,941	9	1	10	1,951 (36%)
1978	9,668	4,574	96	4,670	11	1	12	4,682 (48%)

Note: Recoveries listed under "fishery" include returns from commercial, subsistence and sport fishermen, while recoveries listed under "survey" are tags recovered from spawning ground surveys. Percents listed are the percent of fish recovered based on the number of tagged fish released.

Figure 2. Recovery of fall chum salmon tagged on the north and south bank of the Yukon River in the Galena - Ruby area in 1976 and 1977.

